

MIXED CONVECTION HEAT AND MASS TRANSFER IN A DOUBLY STRATIFIED NON-DARCY POROUS MEDIUM

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The mixed convection heat and mass transfer from a vertical surface embedded in a doubly stratified non-Darcy porous medium have been analyzed. The wall temperature and concentration are constant and the medium is linearly stratified with respect to both temperature and concentration. The external flow is assumed to be uniform. A series approximation is made for both temperature and concentration in terms of the stratification parameter and the solution is presented in both the aiding and opposing flow cases. The flow, temperature and concentration fields are effected by complex interactions among the diffusion ratio Le and buoyancy ratio N and stratification ratio Sr in addition to the flow driving mixed convection parameter Ra/Pe . The effect of double stratification of the medium on non-dimensional heat and mass transfer coefficients is discussed.

Key words: convection, heat and mass transfer, double stratification, Forchheimer flow model, porous medium.

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